national gas transmission

Notes on Completion: Please refer to the appropriate NIA Governance Document to assist in the completion of this form. The full completed submission should not exceed 6 pages in total.

NIA Project Registration and PEA Document

Date of Submission

Jan 2014

Project Reference Number

NIA_NGGT0027

Project Registration

Project Title

Pig trap door seals

Project Reference Number

NIA_NGGT0027

Project Licensee(s)

National Gas Transmission PLC

Project Start

February 2013

Project Duration

1 year and 0 months

Nominated Project Contact(s)

Gemma Parkes (box.GT.innovation@nationalgrid.com)

Project Budget

£42,000.00

Summary

There are 208 pig traps on the NTS all holding a volume of gas at line pressure. Recently there has been an upwards trend in the number of seals failing per year. When the seals fail there is a release of gas to atmosphere. At which point National Grid must isolate the pig trap to stop emissions and repair.

A previous project looking at improving the over-all integrity of Pig Trap Enclosures set the groundwork for this investigation into the elastomer seals fitness for purpose. To understand the cause/source of failure the first phase of work will include a review of existing enclosure and seal details, operating duties and procedures, and seal failure analysis. To establish fitness for purpose and identify potential alternatives, work will be done to establish likely failure modes and will include possible contributory factors / issue findings. Recommendations will then be identified for alternative seals or other solutions to avoid future failures.

Third Party Collaborators

Premtech Ltd

Nominated Contact Email Address(es)

Box.GT.Innovation@nationalgrid.com

Problem Being Solved

There are over two hundred pig traps on the National Transmission System (NTS) and they are required to facilitate internal inspection of pipelines which is a legislative requirement.

Recently there has been an upwards trend in the number of seals on these traps failing each year. This work is intended to assess the

cause of failure and identify potentially alternative solutions to avoid seal failures.

Method(s)

The proposed Method for this project consists of :

1. Data review
2. Seal and Seal Enclosure Inspection
3. Failure Mode Analysis and Report
4. Liaise with seal manufacturers and presentation of proposed potential solutions and alternatives

Scope

There are 208 pig traps on the NTS all holding a volume of gas at line pressure. Recently there has been an upwards trend in the number of seals failing per year. When the seals fail there is a release of gas to atmosphere. At which point National Grid must isolate the pig trap to stop emissions and repair.

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Objective(s)

The goal of this project is to understand the cause/source of pig trap closure seal failures, and investigate the fitness for purpose of existing and alternative elastomer seals; with an aim to preventing future failures.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

The project will propose a number of suitable potential solutions as alternatives to the current seal.

Project Partners and External Funding

n/a

Potential for New Learning

n/a

Scale of Project

The project will look for a solution that can be applied across the NTS asset base.

Technology Readiness at Start

TRL4 Bench Scale Research

Technology Readiness at End

TRL6 Large Scale

Geographical Area

The National Gas Transmission System in the UK.

Revenue Allowed for the RIIO Settlement

None

Indicative Total NIA Project Expenditure

IFI - £13k
NIA - £29k

Project Eligibility Assessment Part 1

There are slightly differing requirements for RIIO-1 and RIIO-2 NIA projects. This is noted in each case, with the requirement numbers listed for both where they differ (shown as RIIO-2 / RIIO-1).

Requirement 1

Facilitate the energy system transition and/or benefit consumers in vulnerable situations (Please complete sections 3.1.1 and 3.1.2 for RIIO-2 projects only)

Please answer **at least one** of the following:

How the Project has the potential to facilitate the energy system transition:

n/a

How the Project has potential to benefit consumer in vulnerable situations:

n/a

Requirement 2 / 2b

Has the potential to deliver net benefits to consumers

Project must have the potential to deliver a Solution that delivers a net benefit to consumers of the Gas Transporter and/or Electricity Transmission or Electricity Distribution licensee, as the context requires. This could include delivering a Solution at a lower cost than the most efficient Method currently in use on the GB Gas Transportation System, the Gas Transporter's and/or Electricity Transmission or Electricity Distribution licensee's network, or wider benefits, such as social or environmental.

Please provide an estimate of the saving if the Problem is solved (RIIO-1 projects only)

Addressing the ongoing issue of seal failure by sourcing the problem and finding a suitable alternative to current practice thereby decreasing instance of seal failure will:

1. Reduce maintenance costs totally approximately £15,000 per year:
   - Projected rate of 15 incidents X £400 per seal = £6,000 per year for seals.
   - Each incident requires resource and call out charges if out of hours, travel and multiple visits
   - for each failure. Two visits for a technician and supervisor per incident at £150 per operative man day is £9,000 per year if 15 incidents occur.
2. Provide environmental benefits based on a reduction in the amount of gas emissions to the atmosphere.

Please provide a calculation of the expected benefits the Solution

Base Case: Expenditure in the region of £150k per annum on asset health issues associated with pig traps
Method case: £135k based on £15k saving as described above.

Please provide an estimate of how replicable the Method is across GB

The Method should deliver an alternative solution suitable to NTS pig traps.

Please provide an outline of the costs of rolling out the Method across GB.

Estimated £5-10k per chosen asset covering time, potential modifications or new seals.

Requirement 3 / 1

Involve Research, Development or Demonstration

A RIIO-1 NIA Project must have the potential to have a Direct Impact on a Network Licensee's network or the operations of the System Operator and involve the Research, Development, or Demonstration of at least one of the following (please tick which applies):

☑ A specific piece of new (i.e. unproven in GB, or where a method has been trialled outside GB the Network Licensee must justify repeating it as part of a project) equipment (including control and communications system software).

☐ A specific novel arrangement or application of existing licensee equipment (including control and/or communications systems and/or software)

☐ A specific novel operational practice directly related to the operation of the Network Licensees system

☐ A specific novel commercial arrangement

RIIO-2 Projects

☐ A specific piece of new equipment (including monitoring, control and communications systems and software)

☐ A specific piece of new technology (including analysis and modelling systems or software), in relation to which the Method is unproven

☐ A new methodology (including the identification of specific new procedures or techniques used to identify, select, process, and analyse information)

☐ A specific novel arrangement or application of existing gas transportation, electricity transmission or electricity distribution equipment, technology or methodology

☐ A specific novel operational practice directly related to the operation of the GB Gas Transportation System, electricity transmission or electricity distribution

☐ A specific novel commercial arrangement

Specific Requirements 4 / 2a

Please explain how the learning that will be generated could be used by the relevant Network Licensees

If an appropriate alternative solution is identified, this will be used to inform specification changes and procurement decisions. The outcome of the project will be disseminated through the National Grid website innovation pages and ENA portal.

Or, please describe what specific challenge identified in the Network Licensee's innovation strategy that is being addressed by the project (RIIO-1 only)

This project is aligned to Optimizing Asset Management within the Reliability theme.

☑ Has the Potential to Develop Learning That Can be Applied by all Relevant Network Licensees

Is the default IPR position being applied?

☑ Yes

Project Eligibility Assessment Part 2

Not lead to unnecessary duplication

A Project must not lead to unnecessary duplication of any other Project, including but not limited to IFI, LCNF, NIA, NIC or SIF projects already registered, being carried out or completed.

Please demonstrate below that no unnecessary duplication will occur as a result of the Project.

n/a

If applicable, justify why you are undertaking a Project similar to those being carried out by any other Network Licensees.

n/a

Additional Governance And Document Upload

Please identify why the project is innovative and has not been tried before

n/a

Relevant Foreground IPR

n/a

Data Access Details

n/a

Please identify why the Network Licensees will not fund the project as apart of it's business and usual activities

n/a

Please identify why the project can only be undertaken with the support of the NIA, including reference to the specific risks(e.g. commercial, technical, operational or regulatory) associated with the project

n/a

This project has been approved by a senior member of staff

- [x] Yes